



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------------------|-------------|----------------------|---------------------|------------------|
| 09/718,767 | 11/22/2000 | Tsuyonobu Hatazawa | 09792909-4673 | 2706 |
| 26263 | 7590 | 11/27/2006 | EXAMINER | |
| SONNENSCHN NATH & ROSENTHAL LLP | | | CREPEAU, JONATHAN | |
| P.O. BOX 061080 | | | ART UNIT | |
| WACKER DRIVE STATION, SEARS TOWER | | | PAPER NUMBER | |
| CHICAGO, IL 60606-1080 | | | 1745 | |

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/718,767

Applicant(s)

HATAZAWA ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,6 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-6 and 8-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 10, 2006 has been entered. Applicants' amendments to the claims have been considered but claims 1, 4-6, and 8-11 remain rejected over Chaloner Gill for the reasons set forth below. This action is non-final.

Claim Rejections - 35 USC § 103

2. Claims 1, 5, 6, and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chaloner-Gill (U.S. Patent 5,445,856) in view of Bullock et al (U.S. Patent 5,219,676) in view of Gozdz et al (U.S. Patent 5,607,485).

Regarding claim 1, Chaloner-Gill teaches a nonaqueous electrolyte battery comprising a lithium metal anode (see column 3, line 40). The battery may be a spirally-wound "jelly roll" type cell (see col. 3, line 45). Regarding claim 11, the battery is a secondary battery (see col. 3, line 31). With regard to claim 1, as shown in Figure 1, the battery element (10) is contained in an outer covering member including a laminated film having an outermost layer and is sealed by heat seals. The claimed "outer covering member" may be defined as the laminate including

layers 64, 66, 68, 70, and 72 (see Fig. 5), and each outer covering member has a recess therein (see Figs. 3 and 4). The laminate may be in the form of a single sheet, with the first and second covering members folded together and heat-sealed (see claims 8 and 17 of Chaloner-Gill).

Regarding claims 1, 5, and 6, the battery comprises a gas absorbing material which is mixed with a resin material and extruded (i.e., molded) to form a gas absorbing member which is formed as a layer (62) between the "outer covering member" as defined above and the battery element (see col. 2, line 61; col. 6, line 33). Regarding claim 1, the gas absorbing material is present in a first gas absorbable member (in member 30) and in a second gas absorbable member (in member 31) (see Figs. 1, 4, and 5). Each of the first and second members is "adjacent" the wound edges of the electrode assembly (see Fig. 4). In the preferred embodiments, combined thickness of the seven layers (60-72) is less than about 500 microns or less than about 250 microns (see col. 9, line 39). In the case of the latter, the thickness of each layer is preferably 20-30 microns (see col. 9, line 42). The gas absorbing material may comprise an activated carbon material (see col. 8, line 13) or silica gel (see col. 9, line 11).

The reference further does not expressly teach that the gas absorbing material is present in an amount of 0.1 to 95 wt. percent on a basis of a weight of the resin material, or that the gas absorbing members have a thickness of between 1-500 microns, as recited in claim 1.

However, the artisan would be motivated to use a suitable amount of gas absorbing material based on the size of the battery and/or electrode element, thereby rendering the claimed range obvious. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215

(CCPA 1980). In this case, it is known that an amount of gas absorbing material can be selected based upon the size of the battery, as shown by column 6, lines 26-35 of Bullock et al.:

The amount of the gel will vary from battery size to battery size within the guidelines of being a sufficient quantity to absorb all water vapor produced during the self-discharge reactions. For normal 12V automobile batteries having six cells, the amount could range between about 50 grams to 300 grams. One skilled in the art could readily select a desiccant quantity by knowing the battery size, plate construction and volume of electrolyte left in the battery after the dumping step.

Although Bullock relates to lead-acid batteries, its teachings regarding the battery size would be applicable to all batteries employing a gas absorbing agent. Accordingly, the artisan would be motivated to use a suitable amount of gas absorbing material in the battery of Chaloner-Gill, thereby rendering the range of claim 1 obvious.

Additionally, the thickness range recited in claim 1 is not considered to distinguish over the references. Claim 1 recites that the members have a thickness of between 1-500 microns. As noted above, Chaloner-Gill teaches that in a seven-layer construction, each sheet preferably has a thickness of less than about 500 microns (or less than about 250 microns). In the case of 500 microns, each sheet would have a thickness of about 70 microns. As such, this disclosure fairly suggests the claimed range of 1-500 microns.

Chaloner-Gill further does not expressly teach that the electrolyte is a gel electrolyte comprising vinylidene fluoride-hexafluoropropylene (PVDF:HFP) copolymer (claims 1 and 7), that the negative electrode contains a carbon intercalation material (claims 8, 9), or that the positive electrode contains a composite oxide of lithium and a transition metal (claim 10).

The patent of Gozdz et al is directed to a lithium secondary battery. The battery may contain a lithium manganese oxide positive electrode, a carbon negative electrode (see Example

Art Unit: 1745

8), and a gel electrolyte containing a PVDF:HFP copolymer and 20-70 wt% of a plasticizer containing an electrolytic salt (see abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Gozdz et al. provides the artisan sufficient motivation to use these materials in the battery of Chaloner-Gill. In column 2, line 30, Gozdz et al. teach the following:

The present invention provides a means for avoiding the disadvantages of prior electrolytic cell compositions and constructions by enabling the ready and economical preparation of strong, flexible polymeric electrolytic cell membranes which will readily retain electrolyte salt solutions and remain functional over a range extending well below room temperature.

As such, the artisan would be motivated to use the electrolyte of Gozdz, as well as the electrode materials, in the battery of Chaloner-Gill.

3. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chaloner-Gill in view of Bullock et al. in view of Gozdz et al. as applied to claims 1, 5, 6, and 8-11 above, and further in view of Wedlake (U.S. Patent 4,269,905).

Chaloner-Gill does expressly disclose that the gas absorbable material is a carbon molecular sieve, as recited in claim 4.

Wedlake is directed to electrochemical cells having a casing containing a layer of molecular sieve material. The molecular sieve may comprise materials such as zeolite and carbon (col. 3, line 59 et seq.).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the carbon molecular sieve of Wedlake in the gas absorbable member of Chaloner-Gill. In the abstract, Wedlake discloses that “this invention involves associating a micromolecular sieve carrier with the cell to sorb such contents when they escape, to reduce the severity of undesired reactions of such contents.” As such, the artisan would be motivated to use the materials disclosed by Wedlake, such as carbon molecular sieve, in the gas absorbable member of Chaloner-Gill in hopes of obtaining these advantages.

Response to Arguments

4. Applicant's arguments filed October 10, 2006 have been fully considered but they are not persuasive. The amendments to claim 1 have been carefully reviewed but are still not considered to distinguish over the structure of Chaloner-Gill. As set forth in the rejection above, the claimed “outer covering member including a laminated film having an outermost layer” corresponds to layers 64-72 shown in Fig. 5 of Chaloner-Gill. The claimed first and second gas absorbable members “positioned between the battery element and the outer covering member” correspond to layer(s) 62 shown in Fig. 5. Although Chaloner-Gill teaches a seven-layer laminate in Figure 5,

the claimed "outer covering member" can be defined as containing less than all seven layers of the laminate, i.e., only the outermost five layers. Further, as the reference fairly suggests that the gas absorbable members are layer(s) 62 as stated above, this interpretation is considered to meet the claim language. Although Applicant's apparent intent is to exclude the gas absorbable members from being part of a laminated structure (i.e., to claim what is shown in Figs. 5 and 6 of the instant application), the claim language fails to adequately specify this. Applicant may wish consider amending the claims to expressly recite that the gas absorbable member is not contained in the laminated film (i.e., to use negative language to effect the desired claim scope).

It is noted that should Applicant amend the claims to require what is shown in Figures 5 and 6 of the instant application, it is submitted that the limitation reciting the thickness 1-500 microns in claim 1 should be deleted or amended. This range is disclosed expressly with reference to Figures 7 and 8 of the present application, i.e., the lamination embodiment, and the specification expressly teaches at page 16, second paragraph that the plate-shaped members should not have a thickness less than 50 microns, which is inconsistent with the presently-claimed thickness range.


Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jonathan Crepeau
Primary Examiner
Art Unit 1745
November 22, 2006